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VA Directorate supports NASA X-37 program

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WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Force Research Laboratory's Air Vehicles Directorate completed vital experimental validations on a subcomponent of a Carbon-Carbon ruddervator control surface that may one day be used on the X-37 reusable launch vehicle.

During a series of thermal and static load failure tests, the ruddervator subcomponent successfully withstood temperatures up to 2,300°F and static loads two times higher than operational conditions. NASA used these test results to verify the ruddervator's analytical model. Subjecting the ruddervator to such extreme conditions was an important part of verifying that it could resist exposure to the conditions experienced during orbit re-entry.

These tests supported NASA's current evaluation of possible control surface designs for its X-37 orbital vehicle concept. The control surfaces include ruddervators, which control pitch and yaw, and flaperons, which control roll and augment lift. The involved nature and volume of testing required for this evaluation process prompted NASA to seek the directorate's help in sharing the work. Boeing provided NASA the test article, which was designed by Science Applications International Corporation and manufactured by Carbon-Carbon Advanced Technologies

The Air Vehicles Directorate's Aerospace Structures Research Facility is the largest combined environment experimental facility in the world. It provides state-of-the-art validation capabilities to all government agencies and to industry and academia through cooperative research and development agreements. In addition to the thermal and mechanical load validation capabilities used for these experiments, the facility is capable of simultaneously exposing structures to mechanical loads, acoustic noise, vibration, and heat to simulate conditions experienced by air and space vehicles during flight. Scientists use this resource to solve various air vehicle structural problems and ultimately increase aircraft performance. @